Remarks- Claims

Claims 1-32 are pending in the application. Claims 1-9, 12-21, 24-29 and 32 were rejected. Claims 10,11,22,23, 30, and 31 were objected to.

1. In the light of the examiner's remarks that limitations from the specification are not read into the claims, Applicants have amended independent claims 1, 16, 24 and 32 to now recite explicitly the additional limitation that the resultant product of the linear combination of the one or more interference vectors is a vector, i.e., of dimension one. Examiner is correct in the assertion that Madhow discloses that the number of columns in the interference subspace matrix is equal to the set of interference vectors. In the Applicant's invention, since these vectors are linearly combined to form another vector, it would have only a single column, irrespective of the number of interference vectors. Applicants believe the independent claims to be novel and non-obvious over the prior art of record. The dependent claims, thus, should be allowable as well.

This limitation is not found in Madhow or in the other cited prior art, and Applicants believe that this step renders the invention novel and inventive over all cited prior art.

Claims 1-9, 12-14, 16-21, 24-29, and 32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Madhow et al. (US 6,175,587), in view of Affes et al. (US 6,975,666).

2. Applicants contend that the two cited prior art references are in different fields of endeavor, when considered as a whole. Madhow (see Figures 1 and 2 showing a downlink transmission from a base station to multiple mobiles) is addressing the problem of interference on the downlink or forward link whereas Affes (see Figures 1 and 2) is primarily looking at interference subspace rejection on the uplink or reverse link. Elements cited by the examiner from Affes for combination (Column 20, line 44 to Column 22, line 56) also refer to mobiles and users, which would not be combinable with the interference matrix and demodulator taught by Madhow, since the interference vectors generated by Madhow would constitute one per downlink channel from the base station, and not from a user.

In addition, when considering Madhow's invention (Column 6, lines 55-60 referring to the plane defined by the interference vectors), there is no motivation suggested in Madhow to combine these vectors linearly to form a single vector since that would alter the direction of the suppression itself, and would constitute a teaching away from Madhow's invention. While the linear combination of interference vectors does reduce complexity, it also changes the directionality of the interference vector, and the lack of degradation of performance and the sometime superior performance observed by the Applicant using a linear combination of interference vectors would constitute evidence of unexpected success.

Further, as Affes points out in Column 28, lines 10-15, Affes' technique is essentially a beamforming solution, whereas, by contrast, Madhow teaches a technique whereby interference is estimated, and then the desired signal is projected orthogonally. Affes not only teaches away from Madhow, but explicitly contrasts their approach from Madhow. Applicants contend that not only would there have been no suggestion to combine these two references, but combining these references would not constitute a working invention.
The sections from Affes cited in the Office Action also confirm this.

3. Applicants further argue that critical elements of the claimed invention are not found in the cited prior art. For example, Affes does not teach linearly combining the vectors to form a composite interference vector. Fig 11 43B consists (see Figure 12 which illustrates the components of 43B) of a despreader and a matrix inverter. Applicants argue that this would not constitute generating a linear combination of one or more interference vectors. In addition, Figure 11, 43B produces multiple streams of data whereas the claimed invention of the Applicants would produce only a single output as a result of this linear combination per set of interference vectors.
The matrix, C_n, cited by the examiner as the interference matrix, is actually a constraint matrix computed by solving a system of equations involving interference vectors, and not by linearly combining one or more interference vectors, as taught by the instant application.

Applicants therefore contend that the 103(a) rejection is improper for the aforementioned reasons and respectfully requests reconsideration.

Conclusion

Applicant has thoroughly discussed the Examiner's objections of the claims in the final Office Action, and amended certain claims in the light of the examiner's comments. Applicant maintains that the claims distinguish from the teachings of all prior art of record, either alone or in any combination. Applicant respectfully requests reconsideration and placement of the application in condition for allowance.

Respectfully submitted,

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